

## LORIOT APP for R3000 LG Series LoRa Gateways

**Configuration Guide** 

Version: V2.2 Date: December 25, 2021 Status: Public Doc ID: LORIOT\_App\_Config\_Guide\_V2.2 Author: David Evans

www.robustel.com Copyright© Guangzhou Robustel Co., Ltd. All Rights Reserved.

## Background

The LORIOT application for Robustel R3000 LG Series gateways provides a quick and easy integration giving customers an off the shelf solution for building LoRaWAN<sup>®</sup> networks at a price/performance ratio that has not previously been available.

LORIOT are one of the world-leading LNS (LoRaWAN Network Server) providers with an impressive catalogue of successful deployments globally.

As a very high-volume manufacturer of 3G/4G routers and gateways, Robustel have commercial advantages unobtainable by many of their peers in the LoRa<sup>®</sup> Gateway market and are consequently able to offer both Indoor & Outdoor Industrial grade, high reliability Gateways at very competitive pricing.



Figure 1.1 – LoRaWAN stack enabled quickly & easily with the "LORIOT APP"

Using a tried and tested LoRa Gateway + LNS combination helps to significantly re-risk the building of new LoRa networks and provides piece of mind that the companies involved have significant prior knowledge of each other's products making effective and detailed technical support easier to come by.

	Contents
Chapter 1	Requirements
<u>Chapter 2</u>	Connecting the R3000 LG to LORIOT platform3
<u>Chapter 3</u>	Connecting LoRaWAN Node/Sensor to the LORIOT Platform7

## **Chapter 1 Requirements**

- 1. Go to www.robustel.com
- 2. Select "contact us" and request the latest LORIOT APP.
- 3. Alternatively, request the APP from your Robustel sales contact

### Chapter 2 Connecting the R3000 LG to LORIOT Platform

1. Install LORIOT APP in the APP center of RobustOS and enter the URL of your LORIOT server and select enable.



Figure 2.1 – App Center installation of LORIOT App

<b>B</b> robust	el		1	Save & Apply   Re	eboot   Logout
	🔬 It is	strongly recommended to change the	default password.		×
	Loriot				
Status	∧ General Settin	ngs			
Interface		Enable loriot	ON OFF		
Network		Server	cn1.loriot.io		
VDN		Enable Private Server	ON OFF		
VPN					
Services					
Syslog					
Event					
NTP					
SMS					
Email					
DDNS					
SSH					
GPS					
Loriot Web Conver					
Advanced					
Smart Roaming					
Smart Roaming					
System				Submit	Cancel
	Соруг	right © 2020 Robustel Technologies. A	All rights reserved.		

Figure 2.2 – Location of LORIOT APP and server settings once APP is installed

#### **Common LORIOT hosted Server URLs:**

#### Africa

AF1 - Cape Town, South Africa

#### Americas

- SA1 São Paulo, Brasil
- US1 California, USA
- US2 New York, USA

#### Asia

- AP1 Singapore
- AP2 Tokyo, Japan
- AP3 Mumbai, India
- CN1 Shenzhen, China

#### Europe

- EU1 Frankfurt, Germany
- EU2 Amsterdam, Netherlands
- EU3 Madrid, Spain
- UK1 London, United Kingdom

#### Pacific

AU1 - Sydney, Australia

<b>B</b> robust	el			Save & Apply   Rel	poot   Logout
	▲ It is s	trongly recommended to change the	default password.		×
	Loriot				
Status	∧ General Settin	gs			
Interface		Enable loriot	ON TOTT		
Network	k	Server	privatelorawan.com	J	
VDN		Enable Private Server	ON OFF		
VPN		Gateway Software URL	https://privatelorawan.	)	
Services			L	_	
Syslog					
Event					
SMS					
Email					
DDNS					
SSH					
GPS					
Web Server					
Advanced					
Smart Roaming					
System					
				Submit	Cancel
	Copyri	ght © 2020 Robustel Technologies. A	All rights reserved.		

Figure 2.3 – If you are using a private server address, then turn on the Private Server button and enter the Gateway software URL

About Gateway software URL: It can be requested from the Loriot platform.

#### 2. Ascertain the default gateway ID in R3000 LG by viewing "Interface->LoRa"

10 robusto	əl				Save & Apply   Reboot   Logout	
${ig \Delta}$ It is strongly recommended to change the default password.						
	General Settings	RF Settings	Stat	us		
Status	∧ Gateway Setti	ngs				
Interface			Enable	ON OFF	No need enable	
Link Manager		Default G	ateway ID	34FA40FFFE01EE8	6	
LAN	L	Iser Defined Gateway	ID Enable	ON OFF		
Ethernet Cellular		Serv	er Address	cn1.loriot.io	Public server or	
USB		Server I	Inlink Port	1700	Private server	
DIDO		Correico Dou	unlink Dort	1700		
Serial Port		Service Dov		1700		
LUNG		Keepaliy	e Interval	10		
Network		statistics Refree	sh Interval	300		
VPN		Push Timeout I	Aillisecond	120		
Services						
System						
					Submit Cancel	

Figure 2.4 – Retrieving identifier required for LORIOT platform from GUI

Note: If you cannot connect to the LORIOT platform using the default Gateway ID, please check the MAC address that the APP is using via the syslog as follows.

Brobuste	Save & Apply   Reboot	Logout
	Syslog	
Status	∧ Syslog Details	
Interface	Log Level Debug v	
Network	Filtering	
VPN	Jul 13 16:38:30 router user.info link_manager[3629]: WAN DHCP ping test success Jul 13 16:38:31 router user.debug modemd[3380]: AT+CPIN? Jul 13 16:38:32 router user.debug modemd[3380]: +CME ERROR: 10	^
Services	Jul 13 16:38:32 router user.debug loriot: starting loriot_robustel_spi Jul 13 16:38:32 router user.notice loriot_robustel_spi: Gateway loriot_robustel_spi version 2.8.1341-JKS-API-23	
System	Jul 13 16:38:32 router user.notice loriot_robustel_spi: Openssl version OpenSSL 1.0.21 25 May 2017	
Debug	Jul 13 16:38:32 router user.notice loriot_robustel_spi[3787]: Using lan0 for GW EUI 34FA40FFFF13FDBE	
Update App Center Tools Profile	Jul 13 16:38:32 router user.notice loriot_robustel_spi[3787]: Requesting system route Jul 13 16:38:32 router user.debug link_manager[3629]: recv action disconnected from modemd Jul 13 16:38:32 router user.debug link_manager[3629]: target link WWAN1, state Disconnected Jul 13 16:38:32 router user.notice link_manager[3629]: WWAN1 disconnected Jul 13 16:38:32 router user.info link_manager[3629]: there is no need to switch link (WAN DHCP:00 - WWAN1:10)	
User Management	Jul 13 16:38:32 router user.debug link_manager[3629]: WWAN1 keep on reset link, wait 600 seconds Jul 13 16:38:33 router user.notice loriot_robustel_spi[3787]: Connecting config server apl.loriot.io Jul 13 16:38:33 router user.notice loriot_robustel_spi[3787]: SSL: loriot1 certificate loaded Jul 13 16:38:33 router user.notice loriot_robustel_spi[3787]: SSL: loriot2 certificate loaded	~
	Manual Refresh v Clear Refresh	
	✓ Syslog Files	<b>X</b>

Figure 2.4 – Debug log confirming correct MAC / identifier for use in LORIOT platfor

3. Go to the LORIOT server and add R3000 LG gateway having created a new Network or using an existing network. The R3000 LG must be a member of a "Network".



Figure 2.5 – Select the R3000 LG from LORIOT Gateway menu scree

Note: There is no need for you to enable the native LoRa interface and set the server information because the LORIOT APP will reference the internal LoRa configuration.

Figure 2.6 – Standard LoRa interface of R3000 LG, LORIOT APP runs independently

#### 4. Input MAC address of gateway interface for LORIOT platform registration.

MAC address of eth0 interface
The MAC Address of the Ethernet port can be queried by running
ifconfig eth0   grep HWaddr
command from your device's console. A sample output will be similar to
eth0 Link encap:Ethernet HWaddr AB:CD:EF:12:34:56
Copy and past the highlighted part (six octets separated by colons) from the output of your device console to the input field below.
eth0 MAC address 34:FA:40:13:FD:BE
Upon successful registration, we will provide you with a setup guide for your gateway and a gateway binary with cryptographic keys tied to this MAC address.
The keys are tied to the MAC address of the device, and cannot be moved to another device.

Please note that FFFE or FFFF is inserted after the first 6 characters of the MAC to make it a 64bit LoRaWAN gateway EUI.

For example, if 34:FA:40:13:FD:BE is the interface MAC, then 34FA40FFFE13FDBE should be the gateway EUI on the LORIOT platform.

5. If everything goes well, you will see R3000 LG online with LORIOT proprietary packet forwarder version info on the platform per below.



Figure 2.7 –R3000 LG correctly configured on LORIOT platform

# Chapter 3 Connecting LoRaWAN Node/Sensor to the LORIOT Platform

1. Set up the LoRaWAN gateway frequency channel list correctly. The example below is AS923 AS2.



Figure 3.1 – RF Frequency section of R3000 LG settings

2. In the LORIOT platform, create a new application and click the "Enroll Device" tab.

LORIO T	■ Applications > SampleApp	Singapore 🚍 📴 Community Account 🔒 🕞
<ul> <li>Back To Applications</li> </ul>	Application / SampleApp	
SAMPLEAPP BE-7A-05-63	🖨 Details	Ltd. Traffic History
← Enroll Device     ← Enroll Multicast Device     ⊞ Bulk Import     & Devices     Multicast Devices	Name SampleApp Cr Application ID BE7A0563 Device Used Capacity 1 Multicast Device Used Capacity 0	Daily Last 24 Hours Daily Messages Received Daily Messages Delivered
₩ Devices Map		
🔥 API Data Format	Configuration The modification of these parameters will change the functionality of the  application, please be careful.	ିଶର ଗୀନ ବିରେ ବିରେ ବିନେ ବିରେ ବିଷନ ବିରେ ବିରେ ବିରେ ବିରେ ବିରେ ବିରତ ବିରତ ବିରତ ବିରତ
<ul> <li>Websocket Applications</li> <li>Statistics</li> </ul>	Allocated Capacity 10	Daily Last 24 Hours
🔦 Join Server	Multicast Device Capacity	200 Daily Messages Received Size

Figure 3.2 – Enroll device / add sensor process in LORIOT platform

3. Enter Title name, and get the "DevEUI", "AppEUI" and "AppKey" from Toolbox.

BE-TA-05-63	LoRaWAN* Version	Enrollment Process		92900 1002 1011 11 102000 2222002
	LoRaWAN* 1.0.x	• OTAA		About Over-the-air activation (OTAA) for LoRaWAN® 1.0:
+ Enroll Device	Location			Over the air activation (OTAA, also known as join or over the ai
+ Enroll Multicast Device	You can define coordinates for static devices e	nabling this option.		network by sending specific association request (join request)
🗮 Bulk Import	Details			the air. This guarantees the highest possible leves of security in LoRaWAN <sup>4</sup> .
🔕 Devices	Title	Device EUI	Application EUI	Note: you only need to use the import feature if you have alread deployed the device with a specific APPREY that you cannot
A Multicast Devices		16 hex digits, carsinclude c	AppEUI (16 hex digits, can	change. For all other cases, please use the standard-enrollment procedure.
Devices Man	Description	Application Key		
		APPREY (32 hox dig(ts)		
Output		Device Profile		
🗛 API Data Format		undefined		
• Websocket Applications			_	
		Create Another	rolf Reset.	

Figure 3.3 – Location of key parameters – DevEUI/AppEUI & AppKey – in LORIOT platform

4. Choose Device and you will see more details of the status and the configuration of the LoRaWAN node.

de lorio t	Applications > SampleApp > Devices     Singapore Commit	anity Account
<ul> <li>Back To Applications</li> </ul>	Devices	
SAMPLEAPP BE-7A-05-63	Filter by	
+ Enroll Device	Device EUI JF Name J RSSI (dBm) J SNR (dB) J devSNR (dB) SF J BAT J ADR J Class J Last Seen J	FCntUp 🕼 FCntDown 📗
+ Enroll Multicast Device	🔲 00-13-7A-10-00-00-C4-D0 Sensor -33 10.2 -27 9 🍽 ADR A 16 minutes ago	78 3
🗮 Bulk Import		
& Devices		
Multicast Devices		

Figure 3.4 – LoRa sensor / node view

Guangzhou Robustel Co., Ltd. Add: 501, Building 2, No. 63, Yong'an Avenue, Huangpu District, Guangzhou, China 510660 Tel: 86-20-82321505 Email: support@robustel.com Web: www.robustel.com